

App. No. 10/804,326
Amendment Dated March 16, 2007
Reply to Office Action of October 16, 2006

Listing of claims:

1. (Currently amended) A method of determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the method comprising:

replicating each field of the document in accordance with a field weight corresponding to the field to produce an individual field set corresponding to each field in the document;

combining each field set for the document into a virtual document;

indexing the virtual document to produce a virtual document statistics; and

computing the field-weighted score from the virtual document index based on the query.

2. (Original) The method of claim 1 wherein the query is associated with a search and the field-weighted score represents a level of relevance of the document to the query.

3. (Currently amended) The method of claim 1 wherein each field weight is represented by an integer value and the replicating operation comprises:

generating each field set to include a number of copies of a field of the document, wherein the number of copies equals the integer value.

4. (Currently amended) The method of claim 1 wherein the replicating operation comprises:

concatenating copies of one of the fields into a field set.

5. (Currently amended) The method of claim 1 wherein the combining operation comprises:

concatenating each field set into the virtual document.

6. (Currently amended) The method of claim 1 wherein the computing operation comprises:

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computing a field-weighted document weight for each query term in the query from the virtual document statistics.

7. (Currently amended) The method of claim 1 wherein the computing operation comprises:

computing a field-weighted document weight for each query term in the query from the virtual document statistics; and

computing the field-weighted score based on the field-weighted document weight for each query term.

8. (Currently amended) The method of claim 1 further comprising:
ranking the field-weighted score with field-weighted scores of other documents.

9. (Currently amended) A computer program product encoding a computer program for executing on a computer system a computer process for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the computer process comprising:

replicating each field of the document in accordance with a field weight corresponding to the field to produce an individual field set corresponding to each field in the document;

combining each field set for the document into a virtual document;

indexing the virtual document to produce a virtual document statistics; and

computing the field-weighted score from the virtual document index based on the query.

10. (Original) The computer program product of claim 9 wherein the query is associated with a search and the field-weighted score represents a level of relevance of the document to the query.

11. (Currently amended) The computer program product of claim 9 wherein each field weight is represented by an integer value and the replicating operation comprises:

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generating each field set to include a number of copies of a field of the document, wherein the number of copies equals the integer value.

12. (Currently amended) The computer program product of claim 9 wherein the replicating operation comprises:

concatenating copies of one of the fields into a field set.

13. (Currently amended) The computer program product of claim 9 wherein the combining operation comprises:

concatenating each field set into the virtual document.

14. (Currently amended) The computer program product of claim 9 wherein the computing operation comprises:

computing a field-weighted document weight for each query term in the query from the virtual document statistics.

15. (Currently amended) The computer program product of claim 9 wherein the computing operation comprises:

computing a field-weighted document weight for each query term in the query from the virtual document statistics; and

computing the field-weighted score based on the field-weighted document weight for each query term.

16. (Currently amended) The computer program product of claim 9 further comprising: ranking the field-weighted score with field-weighted scores of other documents.

17. (Currently amended) A method of determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the method comprising:

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determining a field-specific term frequency for each field in the document for each query term;

weighting each field-specific term frequency according to a field weight designated for the corresponding field to compute a field-weighted term frequency for each query term;

computing a field-weighted document weight for each query term based on the field-weighted term frequency for each query term; and

computing the field-weighted score as a function of the field-weighted document weight of all query terms.

18. (Original) The method of claim 17 wherein the query is associated with a search and the field-weighted score represents a level of relevance of the document to the query.

19. (Currently amended) The method of claim 17 further comprising:

computing a field-weighted document length based on a field weight for each field and a field length for each field, wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

20. (Currently amended) The method of claim 17 further comprising:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing at least one ~~one or more~~ weighted field lengths of the fields in the document, each weighted field length being a field length weighted by a corresponding field weight.

21. (Currently amended) The method of claim 17 further comprising:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing at least one ~~one or more~~ weighted field lengths of the fields in the document, each weighted field length being a field length weighted by a corresponding field weight, wherein the operation of computing a field-weighted document

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weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

22. (Currently amended) The method of claim 17 wherein the determining operation comprises:

determining the field-specific term frequency for each field from document statistics associated with the document, the document statistics including a field-weighted term frequency for at least one query term in the document.

23. (Currently amended) The method of claim 17 wherein the determining operation comprises:

determining the field length for each field from document statistics associated with the document.

24. (Currently amended) The method of claim 17 wherein the operation of computing a field-weighted document weight comprises:

summing at least one ~~one or more~~ weighted field-specific term frequency ~~frequencies~~ of the fields in the document.

25. (Currently amended) The method of claim 17 further comprising:

ranking the field-weighted score with field-weighted scores of other documents.

26. (Currently amended) A computer program product encoding a computer program for executing on a computer system a computer process for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of terms, the computer process comprising:

determining a field-specific term frequency for each field in the document for each query term;

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weighting each field-specific term frequency according to a field weight designated for the corresponding field to compute a field-weighted term frequency for each query term;
computing a field-weighted document weight for each query term based on the field-weighted term frequency for each query term; and
computing the field-weighted score as a function of the field-weighted document weight of all query terms.

27. (Original) The computer program product of claim 26 wherein the query is associated with a search and the field-weighted score represents a level of relevance of the document to the query.

28. (Currently amended) The computer program product of claim 26 wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field, wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

29. (Currently amended) The computer program product of claim 26 wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing at least one ~~one or more~~ weighted field lengths of the fields in the document, each weighted field length being a field length weighted by a corresponding field weight.

30. (Currently amended) The computer program product of claim 26 wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field by summing at least one ~~one or more~~ weighted field lengths of the

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fields in the document, each weighted field length being a field length weighted by a corresponding field weight, wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

31. (Currently amended) The computer program product of claim 26 wherein the determining operation comprises:

determining the field-specific term frequency for each field from document statistics associated with the document, the document statistics including a field-weighted term frequency for at least one query term in the document.

32. (Currently amended) The computer program product of claim 26 wherein the determining operation comprises:

determining the field length for each field from document statistics associated with the document.

33. (Currently amended) The computer program product of claim 26 wherein the operation of computing a field-weighted document weight comprises:

summing at least one ~~one or more~~ weighted field-specific term frequency ~~frequencies~~ of the fields in the document.

34. (Currently amended) The computer program product of claim 26 further comprising: ranking the field-weighted score with field-weighted scores of other documents.

35. (Currently amended) A system for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of terms, the system comprising:

a field-weighted term frequency calculator that determines a field-specific term frequency for each field in the document for each query term and weights each field-specific term

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frequency according to a field weight identified for the corresponding field to compute a field-weighted term frequency for each query term;

a field-weighted document weight calculator that computes a field-weighted document weight for each query term based on the field-specific term frequency for each query term; and

a document score calculator that computes the field-weighted score as a function of the field-weighted document weight of all query terms.

36. (Original) The system of claim 35 wherein the query is associated with a search and the field-weighted score represents a level of relevance of the document to the query.

37. (Currently amended) The system of claim 35 further comprising:

a field-weighted document length calculator that computes a field-weighted document length based on a field weight for each field and a field length for each field, wherein the field-weighted document weight calculator computes a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

38. (Currently amended) A method of determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the method comprising:

computing a field-weighted term frequency for each query term based on field weights designated for individual fields in the document;

computing a field-weighted document weight for each query term based on the field-weighted term frequency for each field in the document; and

computing the field-weight score as a function of the field-weighted document weights of the query terms.

39. (Currently amended) The method of claim 38 further comprising:

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computing a field-weighted document length based on a field weight for each field and a field length for each field, wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

40. (Currently amended) The method of claim 38 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on a corresponding optimized free parameter computed in a non-field-weighted configuration.

41. (Currently amended) The method of claim 38 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on an average term frequency over all terms in a non-field-weighted configuration, an average term frequency over all terms in a field-weighted configuration, and a corresponding optimized free parameter computed in the non-field-weighted configuration.

42. (Currently amended) The method of claim 38 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a factor reflecting a dependence on a number of the fields in the document in which a query term occurs.

43. (Currently amended) The method of claim 38 wherein computing a field-weighted score comprises:

computing the field-weighted score using a factor reflecting a dependence on which field in the document includes the most query terms.

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44. (Currently amended) A computer program product encoding a computer program for executing on a computer system a computer process for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the computer process comprising:

computing a field-weighted term frequency for each query term based on field weights designated for individual fields in the document;

computing a field-weighted document weight for each query term based on the field-weighted term frequency for each field in the document; and

computing the field-weight score as a function of the field-weighted document weights of the query terms.

45. (Currently amended) The computer program product of claim 44 wherein the computer process further comprises:

computing a field-weighted document length based on a field weight for each field and a field length for each field, wherein the operation of computing a field-weighted document weight comprises computing a field-weighted document weight for each query term based on the field-weight term frequency for each query term and the field-weighted document length.

46. (Currently amended) The computer program product of claim 44 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on a corresponding optimized free parameter computed in a non-field-weighted configuration.

47. (Currently amended) The computer program product of claim 44 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a field-weighted free parameter of a BM25 document weighting function, the field-weighted free parameter being based on an average term frequency over all terms in a non-field-weighted configuration, an average term

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frequency over all terms in a field-weighted configuration, and a corresponding optimized free parameter computed in the non-field-weighted configuration.

48. (Currently amended) The computer program product of claim 44 wherein computing a field-weighted document weight comprises:

computing the field-weighted document weight using a factor reflecting a dependence on a number of the fields in the document in which a query term occurs.

49. (Currently amended) The computer program product of claim 44 wherein computing a field-weighted score comprises:

computing the field-weighted score using a factor reflecting a dependence on which field in the document includes the most query terms.

50. (Currently amended) A system for determining a field-weighted score for a document having multiple fields relative to a query having a plurality of query terms, the system comprising:

a field-weighted term frequency calculator that computes a field-weighted term frequency for each query term based on field weights designated for individual fields in the document;

a field-weighted document weight calculator that computes a field-weighted document weight for each query term based on the field-weighted term frequency for each field in the document; and

a search engine that computes the field-weighted score as a function of the field-weighted document weights of the query terms.

51. (Currently amended) The system of claim 50 further comprising:

a field-weighted document length calculator that computes a field-weighted document length based on a field weight for each field and a field length for each field, wherein the field-weighted document weight calculator computes a field-weighted document weight for each

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query term based on the field-weight term frequency for each query term and the field-weighted document length.